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June 9, 1987

A POLITICIZED APPROACH TO WATER TRANSFER IN THE SACRAMENTO/SAN JOAQUIN DELTA REGION

Introduction

The recent history of water transport systems within and from Northern California is filled with conflict and failure in both the societal and physical arenas. Today's tumultuous political posturing over small incremental projects is in stark contrast to the bold plans successfully executed earlier in this century. It is apparent that the old and bold approaches to the utilization of water resources are not acceptable to the increased population that is continuing to come to the state as a direct result of the developed water resources.

It is time to review our old and bold plans to fulfill the water needs of an increasing population in light of current political and environmental awareness. This new awareness has developed coincidentally with the immigration of large numbers of people from regions where the availability of water to meet long-range needs has not been a major concern. Any problems in their former locations were usually solved by the next rain storm or two, and precipitation occurred year round. It is easy for them to fail to recognize that California's dry climate requires massive long distance water transportation systems to support their life-style. And, on the other hand, it is easy for the water distributors to fail to recognize that it is too late to re-educate the new population about California's special water distribution problems and thereby gain their political support for the construction of any proposed large-scale water only plans.

Technical and Political Constraints

The below-sea-level delta region is the critical area in any proposal to transport the total water commitment of the State Water Project. This area is defined as the dry land at the confluence of the Sacramento and San Joaquin rivers generally lying below elevation of minus 5 feet (see Fig. 1). Any plan to complete the State Water Project through the below-sea-level delta is going to incorporate major physical

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changes to the land and waterways. To appreciate this, we have only to compare the elevation drop (the slope which makes water run down hill) in the below-sea-level delta to that built into a smooth cement lined canal. The cross-delta course is essentially flat. There is only six inches of land elevation drop in the 30 miles between Hood and Clifton Court Forebay, whereas the State Water Project lined canals have a six inch drop for each mile. Using the same canal criteria, we are about 15 feet short of enough elevation drop between Hood and Clifton Court. Since the delta pumps are set at a fixed elevation and cannot be lowered, it is not practical to excavate the channel's bottom. Therefore, the width must be increased to reduce velocity and friction losses. The required width under these constraints can be the major part of one mile! It is not difficult to determine that such a solution will not be politically acceptable to any of the indigenous groups of voters in the delta region or even throughout the state.

We need a new positive approach that will gain popular support of voters statewide for the needed water and transportation development required to complete the State Water Project. The body of any new construction plan must recognize all of the competing interests within the regions affected. This includes those areas through which water is transported as well as the areas of origin and the areas of water use. The trick is to find a way to bring the entities representing these competing interests together in some common cause. The failure to achieve this togetherness is largely responsible for the lack of support for recent cross-delta proposals. Recent election results tend to prove that predictions of impending water shortage, poor water quality and the inherent lifestyle inconveniences associated with these problems are not sufficient motivation to influence the population of the State to support any effort to fill in the transportation gap in the State Water Project.

It is likely that future acceptance of any proposal for completing the State Water Project will be decided by voters in a state-wide election. The voters' emotional response level has been raised so high by recent electioneering efforts concerning the peripheral canal, and now interim through-Delta proposals, that any independent legislative action to complete the State Water Project will almost certainly be subjected to a referendum. Knowing this, the Legislature may not attempt any legislation independently but might abdicate their authority to an initiative or require voter's approval of their proposed solution.

To put the problem into a new perspective, we must refine our reasoning processes and increase our data bank to include the needs of voters in the entire State. In other words, most voters perceive that the water development and transportation projects must be coordinated with all of their other needs to define a legitimate and needed state project. This is a big job, but it is the only way that that will have expectations of success.

Assessment of Delta Population and Economics

As a start, let us examine the below-sea-level delta (previously defined in Fig. 1) as a social and economic unit. The land, or "islands", adjacent to the waterways, is from 5 to 20 feet below sea level, with the lowest land on the western edge of the area. Each island is protected from flooding by perimeter dykes. The land area is less than 100,000 acres, and the water area is more than 30,000 acres. There are 150 miles of public domain sloughs and waterways which, of course, are dyked on both sides to maintain the dry land islands, except where the area is adjacent to the higher lands outside the below-sea-level delta. The land values of the islands thus formed range from $2,000 to $10,000 per acre. Although the number of sales is small and the amount of property for sale is small, this seems to be the accepted value range, with the cheapest generally at the lowest elevation. Existing improvements consist mostly of facilities to support the large recreation industry flourishing in the waterways. These consist of marinas with associated dock and boat launching facilities, private boats, restaurants, markets, boat and equipment rental for fishermen, water sportsmen, hunters, and vacationers (see Fig. 2). The estimated total value of recreational facilities is $550 million. Farming improvements consist of warehousing and shipping facilities with minor on-farm improvements consisting of open drainage ditches and pumping equipment to keep the below-sea-level lands dry. The value of these facilities is estimated to be about $80 million. The residential units are relatively old and are confined to small areas to support the permanent farming and recreation operations. They have a combined estimated value of $1 to $5 million.

Both groups, recreation and farming, generate income for the Delta residents and surrounding commercial centers. It is estimated that the recreation activity will generate $60 million per year annual income in the below-sea-level delta area and an additional $90 million per year annual income for the areas in the state where the recreationists reside. Table 1 estimates this geographical distribution.

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Table 1

Residence Location of
Below-Sea-Level Delta Recreationists

San Francisco/Oakland/San Jose	65%
Sacramento	12%
Los Angeles/Long Beach	9%
Vallejo/Napa/Santa Rosa	7%
Stockton	3%
Others	4%

The farming industry estimated average annual income from the below-sea-level delta islands is $50 million per year. However, most of this accrues to persons outside the below-sea-level delta, as there are essentially no resident farmers. The nearby commercial and urban areas will have income from both activities in their economic bases. Some of the lands are in foreign and/or corporate ownership which can widely disperse the accrued income.

The permanent population of the below-sea-level delta is about 4000 persons, and most are engaged in supporting the recreation activities (see Fig. 3). The transient population is seasonal, but it is estimated that 40-50 thousand persons visit the below-sea-level delta for recreation each year. This could be increased with additional improvements to the access roads and permanent facilities as the present facilities are operating at near capacity now.

When the data base is further enlarged to include the transient population and their transient economic values, a new and significant evaluation emerges. The major economic investment is for recreation, and the largest number of voters with a common economic or personal interest in the below-sea-level delta are the transient boaters, fishermen, hunters, swimmers, and vacationers. They exceed by far the permanent population in numbers, influence, and economic clout.

The new way to analyze this data is on the basis of "perceived land use zoning". This says that if a large number of voters perceive that, say, a particular view is desirable, then the legal owner of any land involved in that view is constrained in spite of legal zoning to maintain the view as is. Applied to the below sea level delta, we can conclude that

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a very large and influential population perceives the appropriate use of the below-sea-level area to be water-oriented recreation and that they do not want any changes made by land owners or any public agency that will detract from their use of or access to the waterways. The dry-land use is incidental to the recreation activity since it is neither visible nor easily accessible from the waterways. It also may remain as it is today with private farming activities.

Therefore, it appears that a major political opinion upheaval will be required to allow anyone to change the below-sea-level delta waterways into any kind of a major water transport facility. We must think of another way to provide for additional water transport that will also have the necessary popular support.

Assessment of Water Transport

At this point in our search for a solution, we must also look for additional friendly voters and not offend any that we may gain by recognizing the below-sea-level delta as a playground for the San Francisco-to-Sacramento population. There are large urban and farming centers north, east and south of the below-sea-level delta that are now in the process of searching for supplemental water supplies and improved water quality. Examples such as the cities of Davis, Lodi, Oakland, Stockton, San Jose, and San Francisco, the counties of Sacramento, Alameda and Contra Costa and the farming areas served by Stockton East Irrigation District and Central San Joaquin Irrigation District show that a significant need exists for supplemental water supplies in the Bay-Delta area. It is also a large part of the group that has consistently called for a common pool approach to water distribution through the below-sea-level delta. Their main objection to many previous water transport plans is that no consideration was given to their own supplemental water needs even though the proposed export facilities were, so to speak, to be constructed in their front yards.

A few examples of current activities can show how the need for supplemental water exists:

Sacramento County has recently imposed a building moratorium on a 1,500 unit proposed tract because the CVP could not assure delivery of water.

Stockton East is considering building a canal to New Melones Reservoir for a temporary water supply because the CVP has no plan to extend Folsom South Canal.

The City of Stockton is experiencing delta water intrusion into its domestic wells that degrades water quality to less than acceptable limits.

The City of Davis has lowered some of its wells, although recent floods have relieved some of their problems of sufficient supply.

San Francisco is hoping to raise O'Shaughnessy Dam to increase the yield of the Hetch Hetchy system.

EBMUD is petitioning for American River diversions to supplement the Mokelumne River supply.

Contra Costa is suffering from poor water quality in the Carquinez straights and from the Contra Costa canal. They are currently engaged in a program to build a local reservoir on the proposed Los Vaqueros site.

Santa Clara County wants better quality for its urban water distribution systems.

Alameda County is searching for supplemental supplies.

San Joaquin County is searching for supplemental supplies.

There are others who will welcome access to supplemental supplies to improve their water quality or quantity or both, particularly as standards for drinking water become more stringent.

The list is so long that it makes a persuasive argument that there is a very large block of voters to be served with supplemental water in the Bay-Delta area.

Since the area encompassed by these agencies is so diverse, no estimate of economic value or income can be generated now. Detailed studies of water systems and flow limitations must be made before any reasonable estimate can be made. Suffice to say that the land values and income values are very large, perhaps a significant fraction of the entire state land value and annual income.

The Dual-Objective Plan

A plan with the dual objectives of keeping the below-sea-level delta waterways maintained for recreation without disturbing farm operations and providing supplemental high quality water to the adjacent above-sea-level lands should

have a large and popular voter support and be consistent with the general call for a common pool source of water for all the major population centers.

Let us presume then that the water groups will work to keep the 150 miles of below-sea-level delta waterways and associated dykes just the way they are today, with the addition of better maintenance of the waterway channels and banks. Since there is a significant cost for maintaining the dykes and channels, a large financial base will be required.

One way to provide this financial base could be to persuade the United States Congress to designate the 150 miles of waterways and associated dykes a National Recreational Area. I chose a National Recreation Area for two reasons: 1) The charter is to maintain the designated area in its native state for the enjoyment of all citizens; and 2) the Areas are financially supported by congressional action as a line item in the national budget. To gain support for its creation and annual budget, we can use existing national recreation-oriented periodicals to publicize the merit of the proposal with an editorial emphasis on the unique recreation and beautiful waterways available in the recreation area. The object is, of course, to garner the voter support nationwide. Its designation of the "Bay Area Playground" will be solidly entrenched. On the non-emotional side, the cost per user is one criteria that is applied to support approval of a Recreational Area. There are estimates that as many as 1-3 million people per year use all of the greater delta waterways for recreation now (see Fig. 4). The users come from all over the United States. With improved and enlarged recreational access and use facilities in the below-sea-level delta, these users can be attracted to the below-sea-level delta National Recreation Area. The result will be significantly increased usage, perhaps by as much as 30% of the total, and the projected annual cost per user could approach $50 per user year. This is well within acceptable criteria of existing National Recreation Areas.

The estimated annual cost is primarily for maintenance, since the waterways are already in public domain and the property owners should be ready to give up the dykes at little or no cost in exchange for relief from maintenance. Capital improvement to the dykes for flood protection could amount to $300 million. The interest and redemption would add about $20 million per year to the operation and maintenance costs for an annual total of about $22-25 million per year. Additional money could be made available for the acquisition of the dry land as it becomes offered. Acquired dry land could be leased for farming or developed into a new wildlife and wilderness recreational area.

The potential of the possibilities is unlimited to the extent that recreation oriented money is available.

It could be noted also that with any de-emphasis on farming, many of the dykes could be reinforced from the inside (dry side) at a substantially reduced cost and without disturbing the appearance of the outside (wet side) of the embankments.

The existing State Water Project and Central Valley Project facilities in the below-sea-level delta would operate much as they do now, utilizing off-peak power and tidal pumping but with additional seasonal variations imposed so that the export operations can support the needs of the National Recreational Area to enhance the fishery and wildlife through improved water quality in the waterways. It is also possible that small underwater barriers in the channels east and west of Suisun Marsh could throttle the tidal flow to further improve the below sea level delta water quality. During flood season, planned pumping through the Clifton Court Forebay could be increased to relieve some potential upstream flood damage.

To meet the second objective of satisfying the needs of the Bay-Delta lands for high quality supplemental water, we can propose a joint State-Federal, and perhaps local, participation project organized like the San Luis reach of the California Aqueduct. The proposed aqueduct would draw surplus water from the American River-Sacramento River confluence and lift it into a canal located in the foothills on the east side of the valley. The design could incorporate sufficient fall to have a relatively high velocity, continuously flowing channel to reduce the right of way area requirements and the environmental impact. The aqueduct would cross the valley near the O'Neal forebay in a pipe and discharge to the forebay (see Fig. 5).

Turnouts would be provided for the Mokelumne Aqueduct and the Hetch Hetchy Aqueduct. Other turnouts for local agencies and/or river enhancement could be developed from the detailed studies. I propose that no one be left out and that recreation be enhanced.

This proposed new east side canal facility would carry only the base component of the export requirement to the Bay-Delta and Southern California.

The existing below-sea-level delta facilities would provide the variable capacity component. The Contra Costa Canal and South Bay Aqueduct would be served from the Delta pumping plant through the proposed Kellogg or Los Vaqueros facilities which also would serve as balancing reservoirs to permit

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flexible operation criteria for the Clifton Court Forebay gates. The magnitude of the variations would be dictated by seasonal water availability and the needs of the National Recreation Area for protection of recreation and fish and local needs for water quality.

Availability of water is key to the performance of this project. Additional water-gathering facilities could be built with local user participation. For example, a local mountain agency like Eldorado County could participate in a joint venture dam and allow the exporting water agencies to take the surplus left over after the local need is satisfied. Such projects would eventually accrue to satisfying the local need, and other similar joint venture projects would be built to fill in the required export water supply. Another source could be a buy-out and reallocation of existing State Water Project contractors' entitlements to the new participants in the proposed aqueduct.

It should be pointed out that this proposed east side canal supplements and does not alter the proposed increase in south-of-the-delta reservoir capacity or the proposed improvements in the below-sea-level delta now being considered in the legislature. This canal proposal is similar to the Modified Folsom South Canal proposed in 1971 by the Delta Water Agency, although it is, perhaps, a little more ambitious. No costs were prepared for that proposal, so cost estimates are not even generally available for this proposal.

The two parts to this overall plan will have to be linked together so that the offsetting benefits of each are achieved without fail, since neither part will work alone, either financially or practically. This linkage must be accomplished in the Legislature and in Congress to assure a complete package for the voters to accept or reject.

Although this is not a low budget proposal, it probably has the lowest cost to meet the technical acceptability perceived by a majority of the voters. It has offsets in that the cost of dyke improvements and maintenance are shifted away from the water users to a debit against a National Recreation activity. The pump lift is in parallel with the existing delta pumps, which provides another offset in operating costs.

The concept of the economics of technical acceptability is new. It says: "Public agencies must spend all of the money necessary to achieve a level of technical acceptability demanded by their constituents. Conventional economics has no value until the level of technical acceptability is achieved." In effect, agencies cannot say that any demand is "too expensive" until they have exceeded the level of technical acceptability.

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An example I use to illustrate this is: "The lowest cost way to get rid of personal waste is to throw it out the back door." This was the acceptable technology of sanitation 200 years ago. The level of acceptable technology for waste disposal has risen over the years, from open sewers to outhouses, to septic systems, to full centralized tertiary treatment plants, and is still rising. One could sell a house without a bathroom 75 years ago, but now it is illegal. The unit cost of homes has also risen so that one-third to one-half the cost of a new home is involved in the running water and sanitation facilities built to serve its waste disposal needs.

It appears to me that water agencies should be responding, factually and without emotion, as to what costs are associated with any rise in the level of technical acceptability in the use and delivery of water resources, and if there is no equivalent outcry against cost, then the agencies should get on with it and spend the money. There will always be detractors; deciding differences in the courts and hearings is part of the cost of ascertaining where the level of technical acceptability is perceived to be by the majority of people.

It may be that a significant contributor to the defeat of the Peripheral Canal was that it exceeded the populations's perceived level of technical acceptability for the use of the traversed land. Agriculture and recreational use was given the best technical acceptability. Therefore, it was "too expensive", giving credulousness to the election slogan used so successfully to defeat the referendum.

Conclusion

The proposed overall plan for solving the water transportation, quality and quantity problems described here is an attempt to show a new way to amalgamate the various interests of the San Francisco Bay/Delta regions into a common effort of installing political and physical improvements in the below-sea-level-delta area. The proposed improvements are intended to improve water quality in the channels at the expense of water export to support the local needs for fishery, general water-based recreation and local water needs. In exchange, a new water transport facility is proposed to supplement the needs of the San Francisco/Bay-Delta region and Southern California in an environmentally sound facility. In general, the new plan incorporates the following proposed activities:

1. The below-sea-level delta waterways and dykes would be converted into a National Recreational Area to preserve and financially support the recreation and commercial

activities in the waterways. The National Recreation Area would assume the costs of dyke and waterway maintenance to preserve their native appearance and thus keep this valuable playground available for the enjoyment and use of the general public. Enhancement is expected by organizing given areas for particular activities and installing the required supporting equipment rules and clean up required for safe useage.

2. The existing water export facilities in the below-sea-level delta would be used to help with local flood protection and improved year-round water quality. The standards set by the area administration would preserve water recreation, fisheries and local water quality.

3. The below-sea-level delta lands would remain in their present use under the protection of the improved dykes. As lands may become available for sale, the National Recreation Area could acquire them at their appraised value. Any acquired land could be used for commercial farm leasing or for recreational use.

4. The proposed new joint venture (local, state and federal) east-side high velocity, continuously flowing channel would provide much of the San Francisco Bay-Delta region with supplemental high quality water to meet their population expansion needs. The areas include urban and agricultural users in the counties of San Francisco, Santa Clara, Alameda, San Joaquin, Contra Costa, Sacramento, Yolo and Solano. Also, the Southern California counties would be served a portion of their needs, with the remainder being supplied through the existing below-sea-level delta channels.

5. The areas of origin would have the opportunity to advantageously share in costs of new smaller water reclamation dams to serve their local needs with only surplus accruing the proposed project.

Here is an opportunity to win an election; protect the below-sea-level delta fisheries, recreation uses, and dykes, without disturbing the farming activity; and at the same time, improve water quality for millions of people while providing additional supplemental water to all of the major urban areas in the state. All of this is accomplished by being cooperative and reasonable with a number of dissenting factions. I give you a challenge. Let's do it.

FIG. 1

LOWER LAND SURFACE ELEVATIONS SHOWING BELOW SEA LEVEL DELTA AREA

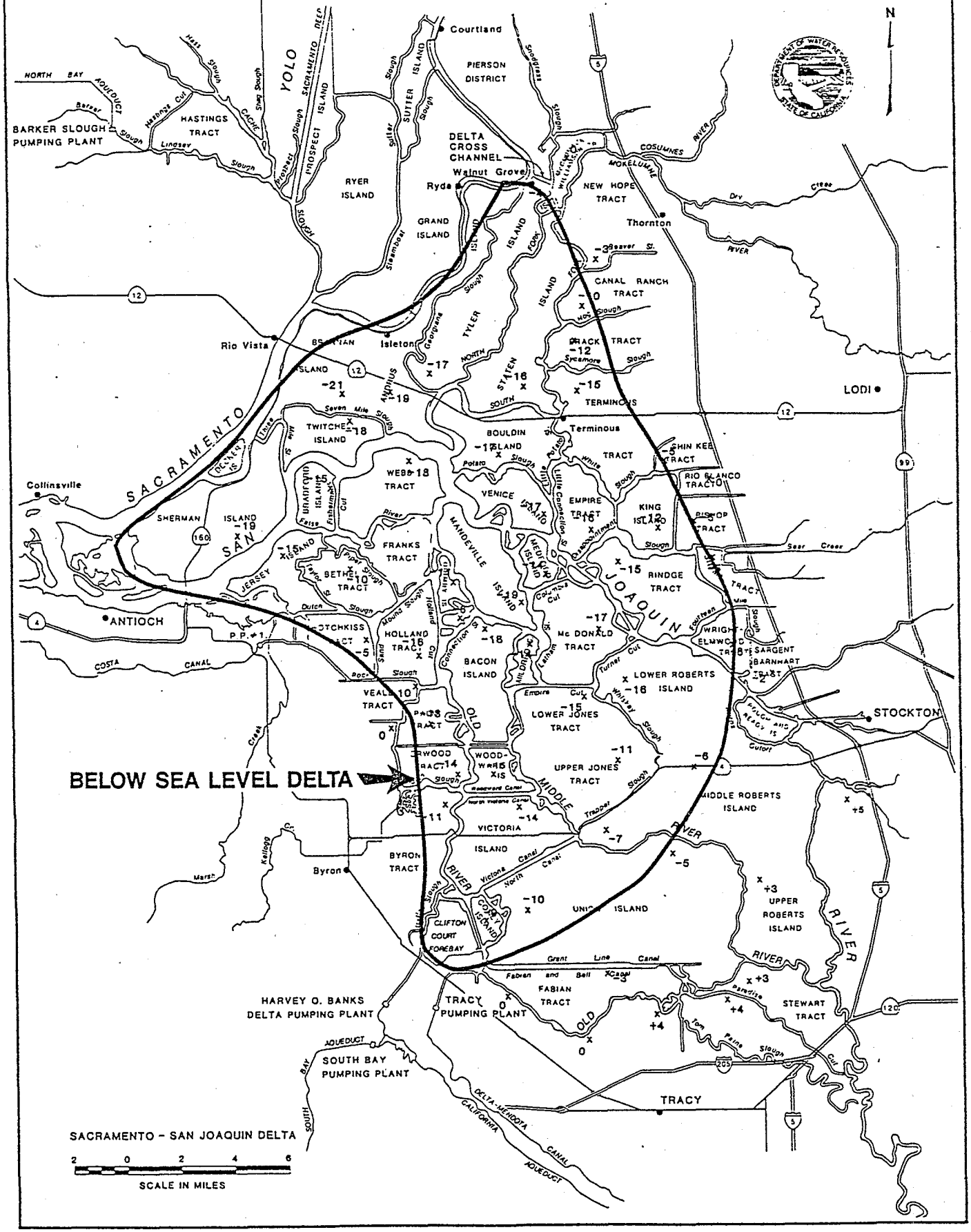

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FIG. 2

LOCATION OF RECREATION AREAS IN AND AROUND THE BELOW SEA LEVEL DELTA

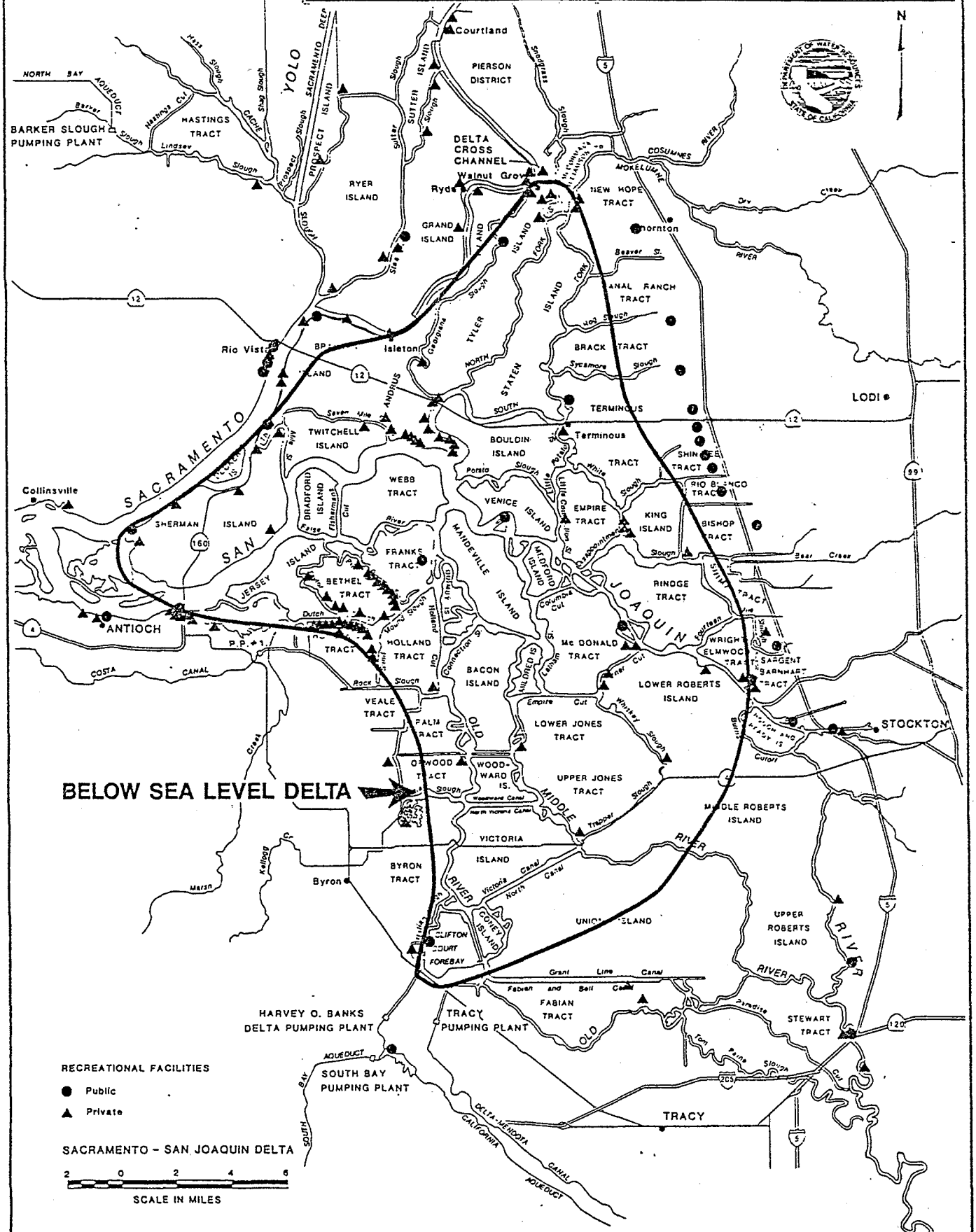

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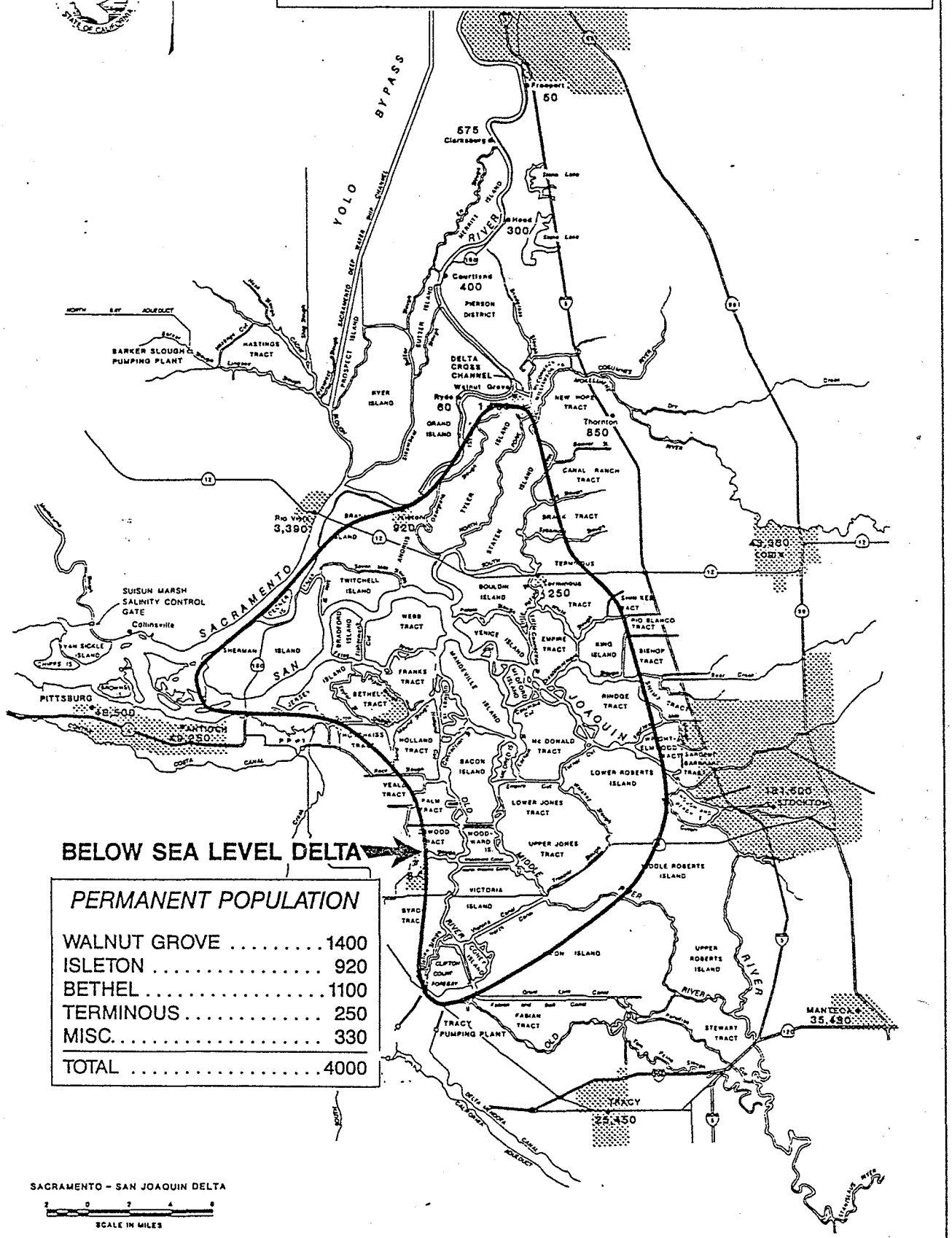
FIG. 3

URBAN DEVELOPMENT, CITY AND TOWN POPULATIONS IN AND AROUND THE BELOW SEA LEVEL



PERMANENT POPULATION

WALNUT GROVE	1400
ISLETON	920
BETHEL	1100
TERMINOUS	250
MISC.	330
TOTAL	4000

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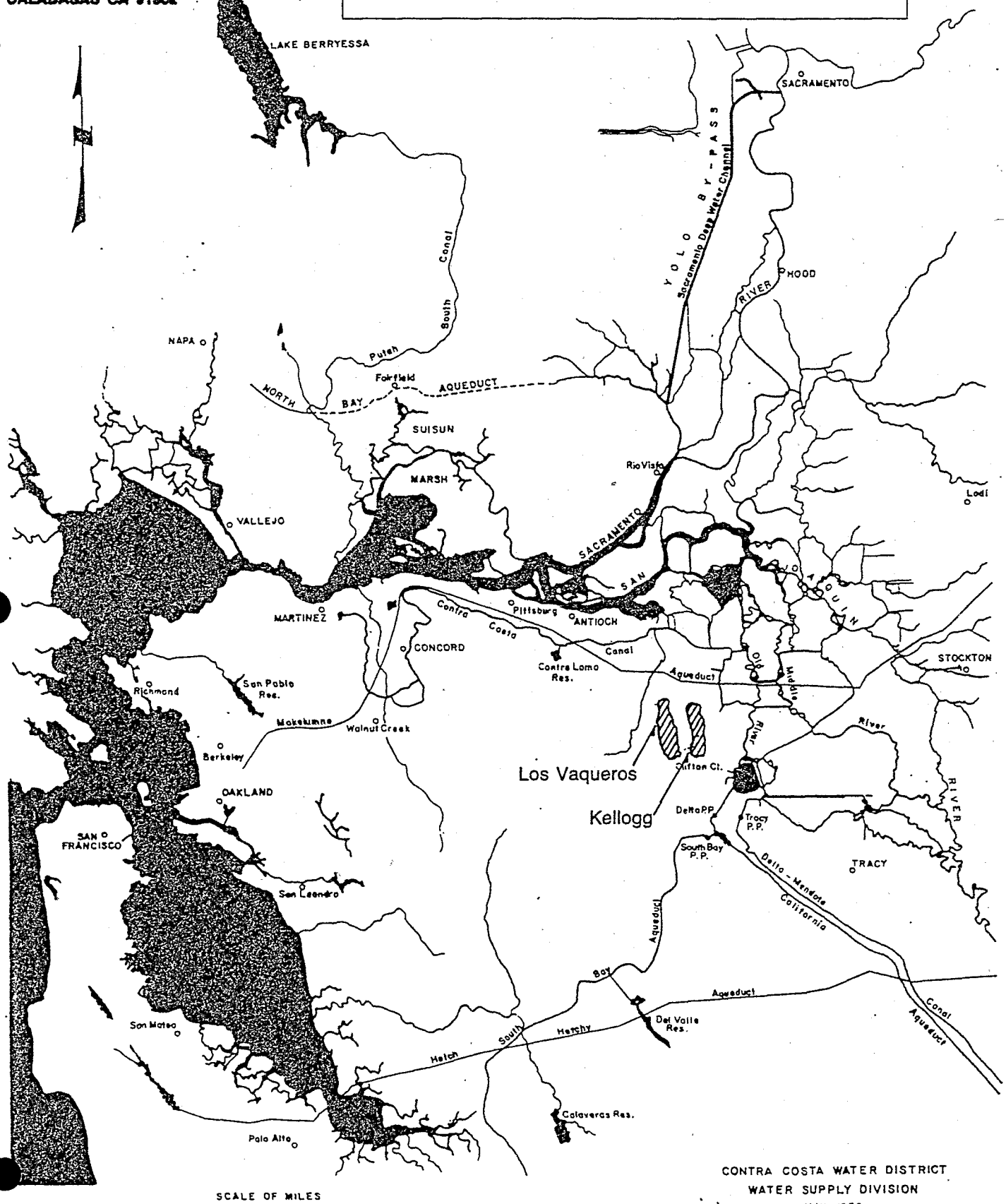
FIG. 4

SACRAMENTO-SAN JOAQUIN DELTA
SAN FRANCISCO BAY

A M STELLE *
24355 LITTLE VALLEY RD
CALABASAS CA 91302



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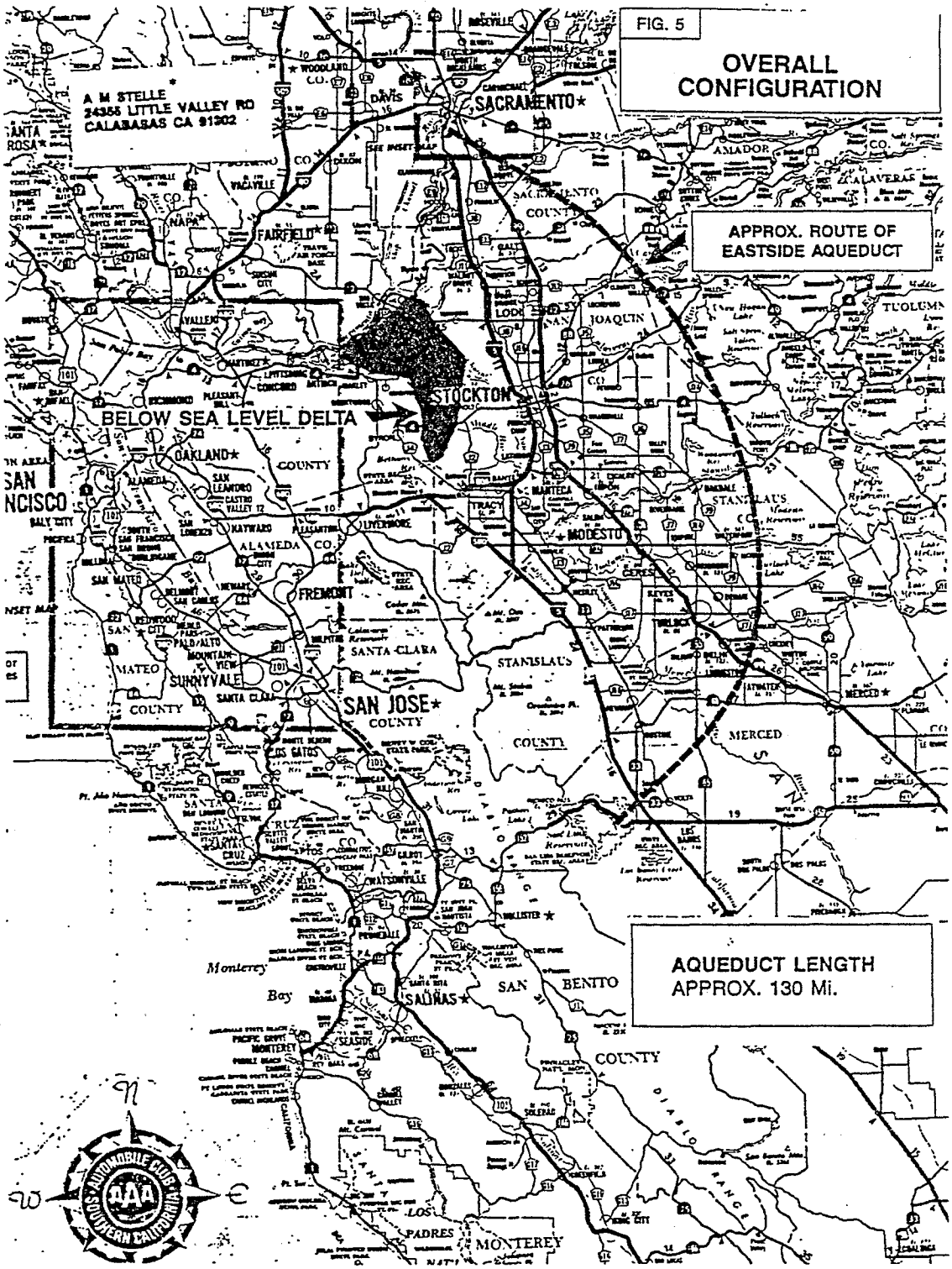

References:

1. Personal observations
2. The Sacramento-San Joaquin Delta: A Summary of Facts (DWR 1979)
3. Layperson's Guide to the Delta (Water Education Foundation, 1987)
4. Information Brochure/Sacramento-San Joaquin Delta (U.S. Army Corps of Engineers 1982)
5. Sacramento-San Joaquin Delta Atlas (DWR 1987)

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